VOL. IV ITHACA, NEW YORK FASC. VI

GENTES HERBARUM

Occasional Papers on the Kinds of Plants

By L. H. Bailey

Various Palms

10. Howea in cultivation
11. Species of Rhapis in cultivation
12. Ptychospermate palms.—Supplement
13. Lucuba palm in the New World
14. Coccothrinax of Florida
15. Geonomas in the Lesser Antilles

Published by The Bailey Hortorium
of The New York State College of Agriculture
at Cornell University
(Mailed at Ithaca Post Office to regular list)
May 31, 1939

111. FLOWERING TREE of *Howea Belmoreana*. Southern California. Note the upward-arching leaves and pinnæ upstanding from the rachis; also the singly-placed spadices.

ARTICLE 10. HOWEA IN CULTIVATION.—THE SENTRY PALMS.

The most popular greenhouse and home palms in the United States are yet confused in nomenclature, even though they have long been in cultivation and the species are only two, and are native on one small island, Lord Howe, in the southern hemisphere between New Zealand and Australia. Four generic names have been proposed for them, but they have no common or useful English name. The generic names applied to one or both species are

Kentia 1870
Grisebachia 1875
Howea 1877
Denea 1926

We may look into the reasons and standing of these names, and while we are doing so I propose an English name, sentry palms, which perhaps will appeal to palm-growers and in time may become a common name. This name may be preferable to the title Lord Howe palms.

Let me forestall objections of non-botanical critics by stating that the four generic names are not whims of their authors. Generic or Latin class names are applied to plants by botanists with both deliberation and caution, and the results are published and evidences stated. These evidences are biological, based on the author's judgment whether the plants are so like the species of an older genus in essential characters as to be included in it, or whether they are so distinct as to require a new genus to be made to receive them. The transfers are the result of careful study, and they express our expanding knowledge of the plants and their structure. Such studies should never be discouraged, nor should any person desire that technical and proper names should be fixed invariably by code or law. The rules of nomenclature provide the procedure by which names are proposed, changes made, and authority established.

Having thrown this impediment before my reader I proceed to say that the genus Kentia was established in 1838 for a palm in New Guinea. Other palms were referred to the genus from time to time, but they have been taken out of it as they have become better known. When C. Moore and Baron Von Mueller in 1870 described the Belmore sentry palm they named it *Kentia Belmoreana*, for the governor of New South Wales and a second species, *K. Forsteriana*, for William Forster, senator in New South Wales,

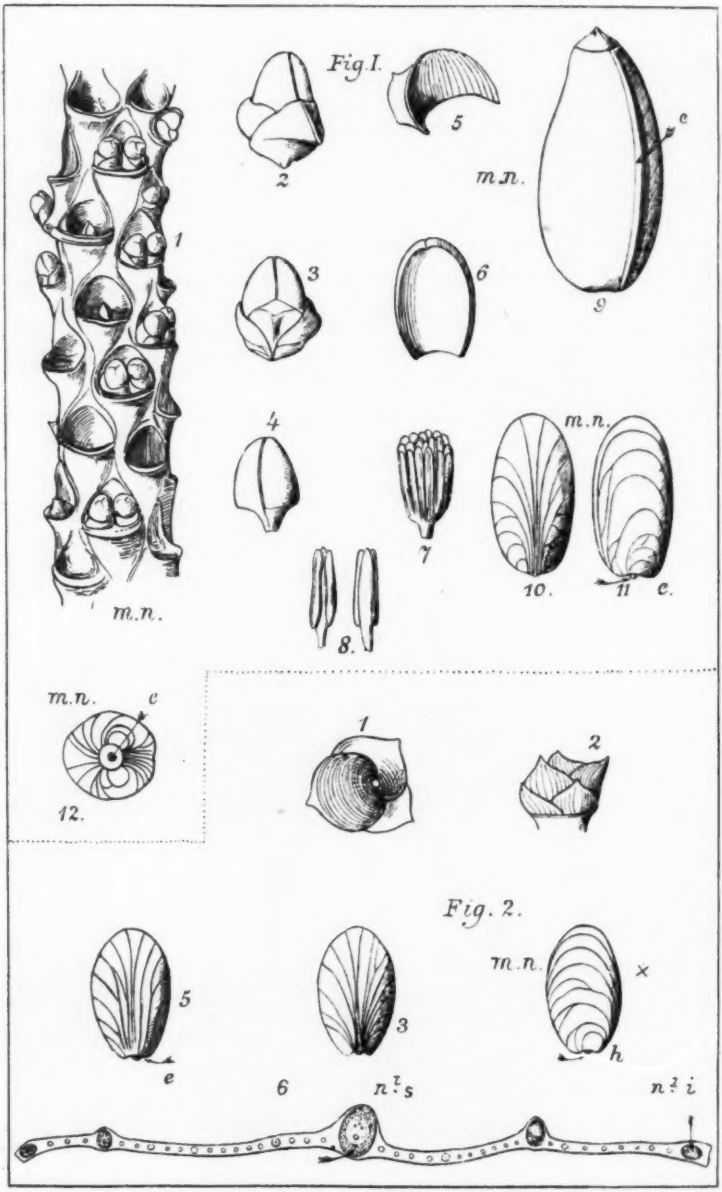
112. HEAVILY BEARING TREE of *Howea Forsteriana*. São Paulo, Brazil. Note that several branches arise from one short main stalk or peduncle.

although they were aware that further study might displace them from that genus.

Wendland and Drude were soon convinced that the palm *Belmoreana* is not a Kentia, and in 1875 they proposed the generic name Grisebachia. This name had been established as early as 1838 for plants in another family and, therefore, under present rules it can not be employed for the palm; the authors were aware of the earlier genus but thought it untenable and it was therefore allowable at that date to disregard it. Noticing this duplication, Beccari in 1877 proposed the name Howea for the two species and this is now a generally accepted name among authors. When organographic studies were made of the two palms, however, by O. F. Cook he decided they should not be retained in one genus and in 1926 he proposed Denea for the species *Forsteriana* and withheld *Belmoreana* in Howea. The names Kentia and Grisebachia may no longer be applied to the sentry palms, but the status of Denea may be discussed, and in the discussion we may learn more about these interesting plants.

Florists and decorators know the distinctions between juvenile plants of *Belmoreana* and *Forsteriana* although the purchaser and general public may not see the differences. The florist rarely sees a mature tree, however, and is not aware of differences in inflorescences and fruits. The botanist must have inflorescences, flowers and fruits before he is able to describe the species accurately or to pass judgment on generic characters.

113. SENTRY TREE of *Howea Forsteriana*. Southern California. Note the horizontal position of the lower leaves, and pinnæ drooping from the rachis; compare with Fig. 111.



114. EARLY PICTURE, 1875, of *Howea Forsteriana* above, Fig. 1, and of *H. Belmoreana* below, Fig. 2; identities at that time reversed. See explanation page 196.

Botanical differences between the two species are marked, particularly in the nature of the spadices, and less so in foliage and stature; yet the flowers and fruits do not depart sufficiently, in my judgment, to warrant separation into two genera, Howea proper and Denea. Genera are supposed to be differentiated primarily on floral and carpological characters: note that the diagnoses in Bentham & Hooker, Genera Plantarum, begin with floral parts, as also in Gray's Manual and many other works. The species hybridize in their native island. For these various reasons I retain the two species in Howea, although there may be differences of opinion on this disposition of them.

These distinctions are the more significant because the two palms are still misunderstood, and it was long thought there is only one species. The botanical names have been interchanged in literature, as Cook has pointed out. Unfortunately, also, these palms are still much listed by dealers as Kentias rather than as Howeas.

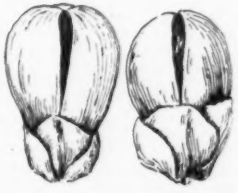
HOWEA, Becc. in Malesia, i, 41 (1877). SENTRY PALMS. Figs. 111, 112, 113, 114, 115, 116, 117, 118.

Howeia, Becc. l. c. 66.

Grisebachia, Wendl. & Drude, in Linnaea, xxxix (n.s., v), 177, 200 (1875), not Klotzsch.

Denea, O. F. Cook, in Journ. Wash. Acad. Sci. xvi, 395 (1926); Journ. Heredity, xviii, 408 (1927).

Slender monœcious unarmed pinnate palms with single prominently ringed trunk and long simple or compound spadices that stand just below the crown (from axils of leaves that may soon fall), each inclosed by a long slender simple paper-like spathe, the pistillate flowers following the staminates on the same rachis: flowers in alveoles or shallow pits but not immersed, normally 3 together, the 2 outer ones staminate and central pistillate, the pistillate remaining as a mere hidden bud until the staminates develop and fall whereupon it develops to full size and emerges from the cavity, so that the spike at any moment of anthesis may look to be wholly staminate or wholly pistillate; staminate flowers large, about 11-12 mm. long at anthesis, calyx of 3 imbricate sepals contained in the alveole, corolla valvate and of 3 coriaceous petals or parts projecting beyond the alveole, stamens 30 to 70 or more with basifixed anthers, pistillode lacking or scarcely evident; pistillate flowers with 3 sepals and 3 petals imbricate and projecting half way from the alveole and stigmas 3, staminodes tooth-like: fruit a nut-like hard body 2-3 cm. long, smooth and glabrous, narrowed either way, yellowish-green to reddish, with firm outer shell and thin smooth mesocarp containing the seed which is single and erect and marked with



115. THE SIMILAR STAMINATE FLOWERS of *Howea Belmoreana,* left, and *H. Forsteriana,* not yet expanded. About 3 times natural size.

looping strands of the raphe, micropyle basal, albumen hard white and plain.

Species two, Lord Howe Island, both of them in cultivation around the world. They are attractive and durable in decoration, and in the pot or juvenile stage are popular with florists. They seldom arrive at the flowering stage under glass. They are well known as trees in southern California. They are little grown as yard trees in Florida. In both states seedlings are extensively grown under cover for the florist trade. They are much employed as sentinel objects about doors and windows, and in the open in regions where they thrive they stand like sentries on lawns. These palms are easy of propagation by seeds. The main technical differences between the two species are given in the descriptive key, that follows:

Petiole very short, leaves strongly ascending and arching, the pinnæ standing conspicuously upright and closely placed on rachis, not squamate or scaly underneath, midrib very prominent on upper surface: spadix simple, to 1 m. (3 feet) and more long, sheathed throughout at first by the inner papery spathe: stamens mostly fewer than 65: fruit turgid, about 3 cm. (1¼ inches) long with the accrescent calyx and one-half as broad, narrowed at apex to a blunt beak; seed about 15 mm. (½ inch) long..... *H. Belmoreana*

Petiole long, central and lower leaves horizontal or drooping as are also the pinnæ so that they have a flat look as compared with those of *H. Belmoreana*, pinnæ attached 5 cm. or more apart and midrib prominent on both surfaces, under surface minutely punctate-squamate: spadix compound, consisting of a flat broad clasping peduncle 3-5 cm. (to 2 inches) long from the apex of which spring 3-8 simple branches 1 m. (3 feet) or more long, side by side, each provided with a long sheathing papery spathe at its base and another similar one midway between the base and the flowering part, the branches abundantly fruitful and hanging, the spathes in the meantime becoming dry, shredded and perhaps vanished: stamens above 65: fruit longer than that of *H. Belmoreana*, 3-5 cm. (to 2 inches) long, gradually narrowed to apex but scarcely beaked; seed mostly about 20 mm. (¾ inch) long..... *H. Forsteriana*

Howea Belmoreana, Becc. in Malesia, i, 66 (1877). BELMORE SENTRY PALM. Figs. 111, 114, 115, 116, 117.

Kentia Belmoreana, Moore & Mueller, in Fragmenta Australiæ, vii, 99 (1870); Mueller, l.c. viii, 234 (1874).

Grisebachia Belmoreana, Wendl. & Drude, in Linnaea, xxxix (n. s., v), 202 (1875).

Small tree to 7 m. (24 feet) and probably more, the trunk with strong horizontal rings and usually a large expansion at base: leaves in a rather close head due to the short petioles, 2 m. more or less long, main pinnæ 3 cm. broad at center: spadix arching downward and in short trees nearly touching the ground, the 2 thin spathe-valves soon falling: fruits usually not closely packed on the rachis.

A var. **variegata** of *Howea Belmoreana* was listed more than forty years ago, but I have not seen it.

Howea Forsteriana, Becc. in Malesia, i, 66 (1877). FORSTER SENTRY PALM. Figs. 112, 113, 114, 115, 116, 118.

Kentia Forsteriana, Moore & Mueller, in Fragmenta Australiæ, vii, 100 (1870).

Grisebachia Forsteriana, Wendl. & Drude, in Linnaea, xxxix (n. s., v), 202 (1875).

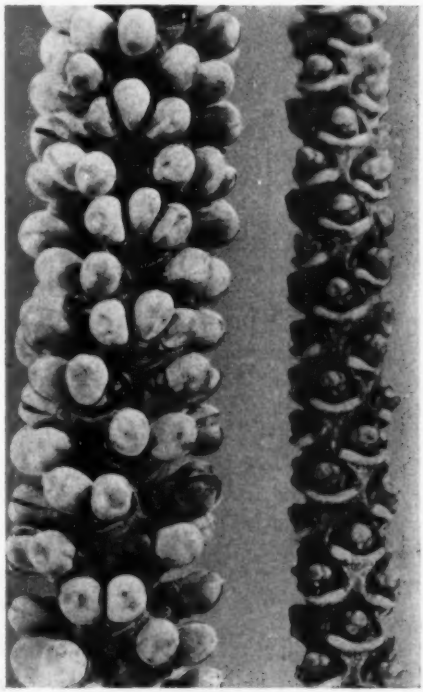
Denea Forsteriana, O. F. Cook, in Journ. Wash. Acad. Sci. xvi, 397 (1926).

Taller tree, to 10 m. and said to reach twice and more that height in its native place, trunk more or less irregularly or obliquely ringed, base not unusually expanded: leaves in an open head inasmuch as petioles are longer and pinnæ more loosely placed, to 3 m. and more long, main pinnæ 3-4 cm. broad at center: spadices very fruitful, fruits close together, hanging long and the nuts persistent, whence Cook's name Denea from a Greek adjective "meaning long-lived or enduring, in allusion to the remarkable persistent inflorescences and fruits."

This is the more common in cultivation in the United States of the two sentry palms, being rugged, quick-growing, and adaptable to diverse conditions. It is much sold by florists.

A single tree of *Howea Forsteriana* with parallel variegations on the leaves was recorded on Lord Howe Island nearly twenty years ago. It was about 30 feet high and probably thirty or forty years of age.

Confusion in the identity of the Howea palms starts at the beginning of our technical knowledge of them. Moore and Mueller give a good account of



116. PARTS OF FLOWER SPIKES of *Howea Belmoreana* left, and of *H. Forsteriana*, nat. size. Left, staminate buds, just ready to open. Right, staminate flowers fallen and pistillate flowers not yet fully emerged.

Belmoreana but only a brief and incidental mention of *Forsteriana*. The pictures given by them in their publication of the two palms in nature does not contribute to an understanding of the trees.

In the original diagnosis of *Belmoreana* in 1870 the spadix is described as long and simple, whereas in the revised account of 1874 the spadix is said to have three to five spikes joined together. Apparently the inflorescence of *Forsteriana* was then in hand and was thought to belong to *Belmoreana*. When Wendland and Drude described the Australian palms in 1875, the spadix of Grisebachia (which they separated from Kentia) was said to be simple; the fruit of *Forsteriana* was said to be thicker than that of *Belmoreana* and the spadix not much more than one-half as long, whereas the thick fruit and the very long simple spadix go together and belong with what was early founded as *Belmoreana;* the picture accompanying the text (reproduced in Fig. 114) shows both species but the names were reversed in the original. In 1888 *H. Forsteriana* was erroneously figured as *H. Belmoreana* in Botanical Magazine t. 7018, but in 1918, t. 8760, *Belmoreana* was correctly illustrated in that journal, so that both species have now appeared in that substantial periodical.

117. RIPE FRUITS, full size, of *Howea Belmoreana*.

The items in Fig. 114, taken from Linnaea, xxxix, tab. iv, are as follows: Fig. 1 at top, *H. Forsteriana:* 1, part of spadix near its base; 2, 3, staminate flower in bud; 4, same, with calyx removed; 5, sepal, showing dorsal keel; 6, petal, front view; 7, stamens; 8, stamens, side and front view; 9, fruit; 10, seed, back view; 11, same,

side view; 12, same, basal view. Fig. 2 at bottom, *H. Belmoreana:* 1, corolla enlarged on fruit; 2, calyx and corolla on fruit, side view; 3, 4, 5, seed, back, side, and front view; 6, cross-section of small pinna, showing midrib and veins.

Final clarification of the Howeas awaited the careful studies of Beccari published in 1913 in Webbia (iv, pages 156-168). He concludes the account in a contrast of the characters in parallel columns of text. These studies were followed and confirmed by those of Cook, which I have cited, published in 1926 and 1927.

Perhaps we shall never know precisely all that was intended in the original publications of Von Mueller, but the cultivator should now be able to distinguish and understand the two sentry palms.

Several hybrids between *Howea Belmoreana* and *H. Forsteriana* have been noted on Lord Howe Island, and they were recorded by J. H. Maiden, Government Botanist, in Proceedings of the Linnean Society of New South Wales for the year 1920 (vol. xlv, page 565). The leaf characters partook largely of *Belmoreana;* fruits were dull carmine-lake with a base of cherry-red.

118. RIPE FRUITS, about full size, of *Howea Forsteriana.*

We should not leave this discussion of the Howeas without brief mention of the collecting of their seeds on Lord Howe Island, and I make a few extracts from an article on the subject by G. P. Darnell-Smith in Bulletin of Miscellaneous Information, Royal Botanic Gardens, Kew, 1929:

"The Island, which is of volcanic origin, is crescent-shaped and is about 7 miles in length and from half a mile to one and three-quarters of a mile in width, and contains the small area of about 3,220 acres. It forms part of the State of New South Wales, Australia, and is situated in the Pacific Ocean, 300 miles from the coast.

"On the Island there is a small but sturdy population of about 120

souls. The whole of the Island is Crown Land and the Islanders are wholly dependent upon the returns from the seeds of the palms.

"This peculiar and unique Island industry affords a very interesting and successful practical experiment in state socialism, which probably would not be possible in any other part of the world, since the conditions which prevail on the Island are so unusual.

"On the Island a committee of three members is elected by the Islanders themselves to carry out the instructions of the Board of Control whose headquarters are on the mainland. The Board in Sydney obtains orders from various parts of the world for the Kentia palm seed and then arranges, through the local committee on the Island, for each Islander participating in the benefits of the seed industry to collect a certain proportion of the seed required.

"As soon as the Palm seed is collected by the Islanders, it is immediately fumigated, then carefully measured and, with suitable packing (banyan soil), placed in three-bushel corn sacks containing two bushels of seed and one of the banyan soil. It is then shipped from the Island to Sydney—a journey of 48 hours—from whence it is exported to growers abroad, after being repacked in cases."

Lord Howe Island was discovered in 1778. Several accounts of its vegetation have appeared, among them being C. Moore's in Gardeners' Chronicle, September 11, 1869, page 968, and in Transactions of the Royal Society of New South Wales for 1871, page 29; W. B. Hemsley, 1896, in Annals of Botany, x, page 22; W. R. B. Oliver, 1917, in Transactions and Proceedings of the New Zealand Institute, xliv, pages 94-161 with illustrations. Oliver lists the vascular plants of the island as then known, comprising 169 genera and 209 indigenous species. There are four species of palms, all endemic: *Clinostigma Mooreanum*, *Hedyscepe Canterburyana*, *Howea Belmoreana* and *H. Forsteriana*. He mentions "two specimens of supposed hybrids between *Howea Forsteriana* and *H. Belmoreana*. In their essential characters they were both *H. Forsteriana*, but had some of the habits of *H. Belmoreana*. Although one must be cautious in accepting as hybrids variants in nature, I think the present specimens are best considered as such."

Oliver writes that "of the 169 genera of vascular plants represented on Lord Howe Island four are endemic. . . . There are seventy endemic species of vascular plants, or 33 per cent. of the total number of species occurring there." This indicates that the flora of the island is peculiar to itself. Howea is one of the four endemic genera.

ARTICLE 11. SPECIES OF RHAPIS IN CULTIVATION. —THE LADY PALMS.

The Rhapises are rattan-like small palms that have long been favorites in conservatory tubs, for planting in the open in regions practically frost-free, and for use in the decoration of residences and halls. They are easy to grow and of long duration, and the habit of making many leafy reed-like stems increases their ornamental appearance. The long leaf-sheaths are curiously divided into woven fibers that add to the decorative character. It is recorded that the introduction into England was as early as 1774. They are Chinese palms.

Yet, for all our long familiarity with these lady palms, they remain to this day singularly confused as to identity and nomenclature. Prime reasons for this state of affairs are the facts that the plants are diœcious and the grower may not have the two sexes for seed production, and that they propagate by suckers and, therefore, we may not know whether characteristics of individual plants rather than broadly of the species may not have been perpetuated. We are still obliged to contrast the kinds by foliage characters rather than by flowers and fruits. Flowers of one sex or the other may be produced tardily or perhaps not at all.

Nine species of Rhapis are recognized, most of them recently described and probably not in cultivation. It will be well for us to have an organized presentation of the genus before we attempt to discuss the species.

RHAPIS, Linn. f. in Aiton, Hort. Kew. iii, 473 (1789). Lady Palms.

Arundinaceous stoloniferous small functionally diœcious palms with palmate leaves and leaf-bases resolved into prominent open woven or reticulate sheaths, the leaves either mostly terminal or alternate along the stems: leaf-segments flaring in one plane and extending nearly or quite to the petiole, narrow, few to many (1 or 2-20), strongly ribbed lengthwise and often cross-veined, glabrous, variously dentate or cut at apex, margins plain or serrulate: spadices interfoliar, projecting from the leaf-sheaths, not equalling the petiole, sparingly forked, the short peduncle mostly or wholly included in the sheath; spathe reduced to 2 dry bracts; flowers small, solitary, sessile or essentially so, not immersed; staminate (male) flowers about 7 mm. or less long, with a cup-like 3-toothed calyx and a much projected tubular obovoid 3-cleft corolla that contains 6 anthers and usually 3 small pistillodes at the bottom; pistillate flowers shorter, the calyx and corolla 3-lobed and the 3 carpels soon evident or projecting, style short and stigma a point, staminodes usually present: fruits 1-3, separate, commonly only one maturing from a flower, globose to somewhat obovoid,

to 8 or 10 mm. long, glabrous, with a fleshy and more or less wrinkling exterior, filled with a hard seed containing plain albumen and micropyle toward the base, but seldom produced in cultivation.

The generic name Rhapis is closely matched by Rhaphis, a genus of grasses, dating 1789 and 1790 respectively. These are distinct Greek words, however, and therefore do not come within the prohibition of "orthographic variants" (International Rules, Art. 70). The palm name Rhapis, *rod*, suggests the rod-like canes or stems.

It is not easy to match certain of the cultivated lady palms with botanical descriptions of the species, so much so that several questions are raised:

119. Stand of lady palm, *Rhapis excelsa*. Ft. Myers, Florida.

(1) are the descriptions always complete? (2) are there plants in cultivation not accounted for in the formal descriptions? (3) are some of the plants in cultivation perhaps clons (asexual multiplication of a single original plant) that may have varied from the type? (4) are some of them grown from seeds hybridized in Europe or other regions where opposite sexes of different species may have been close together? (5) does the same species vary decidedly in stature and habit under differing conditions?

We are not to answer all these questions in this paper. As a beginning, let us review the species of Rhapis now described. Without fruits, and even without flowers in most cases, it is impossible to make a close study of the situation.

The general descriptive treatment is drawn heavily from the latest work of Beccari, published posthumously by his coworker the late Ugolino Martelli in Annals of the Royal Botanic Garden, Calcutta, in 1931, and by publications of Burret in 1930 and 1937. Two species have long been planted, *R. excelsa* (*flabelliformis*) and *R. humilis*, and to these we may direct our main attention.

To understand the relationships and differences we must have a key to the species, and it follows. For aid of the planter, however, the two horticultural species are discussed first, after the key, and then brief descriptions are given of the other kinds in alphabetic order.

A. Leaf-blade not divided to the base or to the apex of the petiole, at least not in the central part (little segments at the sides may be disregarded for the present purpose).

B. Species with broad central leaf-segments, 3 cm. or more wide at middle of main ones on full-grown leaves.

120. LOW SPREADING COLONY, not sending up tree-like canes, of *Rhapis excelsa*. Southern Brazil. Row of ferns (Nephrolepis) at bottom.

c. Apex of segments broad and almost truncate even though dentate: leaf-sheath network coarse and rigid, composed of stiff and loose elements: segments 5-10 or more. Fig. 123 ..... *R. excelsa*
cc. Apex nearly or quite acuminate, the teeth very connivent (facing close together): stem with leaf-sheath 15 mm. or less diameter: sheath of fine closer fibers: segments usually (not always) 3..... *R. laosensis*
ccc. Apex narrow but hardly acuminate, teeth distinct: stem with sheath 2 cm. and more diameter: sheath of fine fibers: segments 4.... *R. robusta*
BB. Species with narrow leaf-segments, commonly less than 3 cm. broad.
c. Segments at least 7 or 8 to each mature leaf, less than 2 cm. broad at middle and narrowed to either end..... *R. humilis*
cc. Segments 12, about 15 mm. broad, 2-costate..... *R. multifida*
ccc. Segments 3-4.
D. Length of segments to about 12 cm..... *R. gracilis*
DD. Length of segments to 30 cm. and more..... *R. filiformis*
AA. Leaf-blade divided completely to apex of the petiole.
B. Segments of leaf 2-4 ..... *R. subtilis*
BB. Segments 6-10... ..... *R. micrantha*

Rhapis excelsa, Henry ex Rehder, in Journ. Arnold Arb. xi, 153 (1930).
LARGE LADY PALM. Figs. 119, 120, 122, 123, 125, 126, 127.
Chamærops excelsa, Thunb. Fl. Jap. 130 (1784).
Rhapis flabelliformis, L'Her. apud Aiton, Hort. Kew. iii. 473 (1789).

Habit loose or open when growing in the ground (rather than in a tub) with leaves widely spreading on petioles equalling or exceeding the blade; canes or trunks eventually becoming 4 or 5 cm. thick and 5 m. or more tall, the lower shredded leaf-sheaths falling and disclosing a smooth green surface with rings 4-8 cm. apart, yet sometimes remaining for years 1 m. or so tall and not much thicker than a goose-quill when sheaths are removed and the rings as close together as 1-2 cm.; netted or braided fibers of leaf-sheath differing greatly on canes of various size but always relatively coarse, and loose or ruffled or ravelled: leaves glossy green, 40-80 cm. across, segments 5-10 on average full-grown leaves but perhaps twice or more that number on vigorous plants, free to within 5 to 8 cm. of top of petiole, central one 25-35 cm. long and 5-7 cm. broad at middle, with 2-4 strong and often scarious ribs and a thinner one between each pair, prominently cross-hatched or -veined, so that the surface has a somewhat bullate or puckered appearance, margins finely serrulate and evident to the finger, apex narrower than middle but not acuminate or pointed (with more or less

121. TUB SPECIMEN of *Rhapis humilis*.

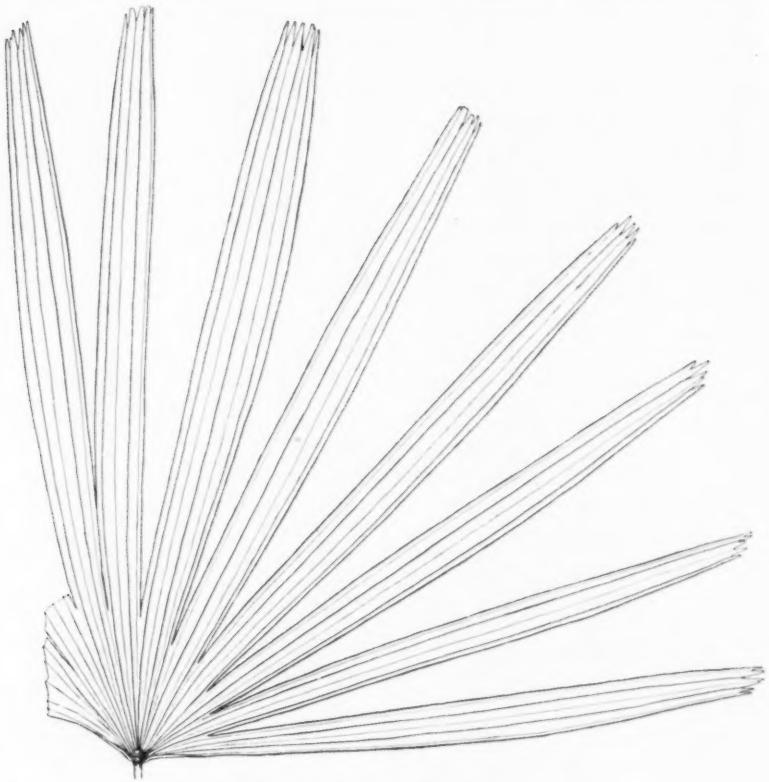
exceptions in laterals and on aberrant plants), obliquely or irregularly semi-truncate and toothed, hastula small and commonly rather coarsely bearded and sometimes chaffy on margin: spadices from upper leaf-axils, shorter than the developed petioles, two to three times forked, peduncle 2-4 cm. long, little protruding beyond leaf-sheath and subtended about its entire length by a thin membranous glabrous or somewhat floccose spathe-valve, the other valve subtending the first fork of the inflorescence which may be 15-30 cm. long of which the branches and short rachillæ are glabrous; staminate flowers fleshy, 5-6 mm. long at maturity, the calyx thickened and short-acute, filaments adnate to corolla and keeled, corolla two to three times length of calyx; pistillate flowers about 4 mm. long: fruit short oblong-subpyriform, about 10 mm. long and more than one-half as broad, thinly fleshy, 1-3 from a single flower, each containing within the mesocarp a single free globose more or less glossy seed about 6 mm. in diameter.

Ascribed to China, but its exact nativity not yet established. Beccari writes, —"its true home, however, is to be looked for, I think, in lower eastern China only." Burret writes, 1937, "Ob dasselbe wirtlich von wildewachsenden Pflanzen stammt, ist nicht sicher."

122. CONTRASTS IN LEAF-SHEATHS. *Rhapis excelsa* left; *R. humilis*. About one-half natural size.

It was long supposed that the *Chamærops excelsa* of Thunberg was the palm later separated as Trachycarpus, whence the binomial *T. excelsus;* but examination of the Thunberg material shows that he had a Rhapis, and this accounts for the subjugation of the well-known name *Rhapis flabelliformis.* The Trachycarpus now becomes *T. Fortunei* (see Gent. Herb. ii, 188-191).

Complete monographic study of Rhapis requires examination of much more herbarium material than is to be found in this country, together with caretul review of such type specimens as may exist. As yet, we must continue to define the species largely in the customary way. It requires, also, observation on the stocks in cultivation, and this phase of the subject has not heretofore received much consideration. There may be hybrids between *R. excelsa* and *R. humilis,* but this cannot be assumed; and in view of the



123. PART OF LEAF-BLADE of *Rhapis excelsa* (×⅓).

infrequency of flowers of the latter species, this may be doubtful. For the present, I call attention to the remarkable clonal variation in *R. excelsa*.

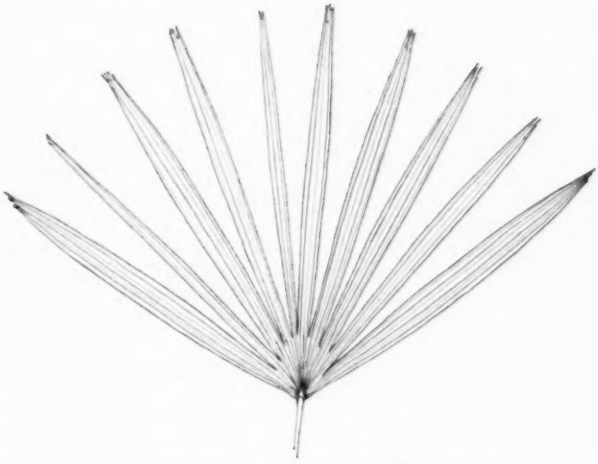
The stand in Fig. 119 represents what is commonly considered to be regular *R. excelsa*. If this stock were in a tub it would be a more compact group, with canes closer together. The broad leaf-segments and long petioles at once distinguish it.

The great dense clump in Fig. 120 appears to be a wholly different thing, and it may sometimes be called *R. humilis* or "the dwarf" species. However, the leaf and other characters are good *R. excelsa*, and sometimes after years of waiting such a clump may send up stems a dozen feet or more tall. It is a case of vigorous stolon growth and of arrested trunk development. We are to remember that it is more than 150 years since this palm was introduced into the western world and has been propagated asexually with preservation of marked races; and it may have been so propagated for centuries in the Orient before introduction to the Occident.

Variation in the number of segments to a leaf is marked, from as few as 5 or 6 to 27, the latter being the highest number known or reported to me. Stands may show marked differences in the shedding of the sheaths; in some cases these coverings may hold almost or quite to the ground, in others the cane may be bare for six feet above the base.

In certain stands of *R. excelsa* most or all the leaves have more or less acuminate segments that may be confused with those of *R. humilis*, but the segment-tips are nevertheless distinct in the two species, and the corrugated surface, due to strong cross-nerving, distinguishes *R. excelsa* in such cases as well as the thicker substance and brighter green; and the leaf-sheaths are distinctive.

There is a var. **variegata** of *R. excelsa*, with segments striped whitish or yellowish, but I have

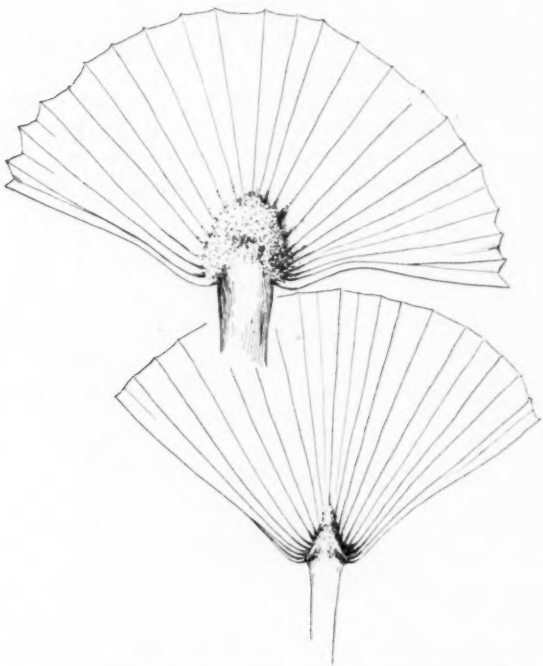


124. Leaf-blade of *Rhapis humilis* (×¼).

not seen it. Other forms have been named, but their importance is unknown to me.

Rhapis humilis, Blume, in Rumphia, ii, 54 (1836). SLENDER LADY PALM. Figs. 121, 122, 124, 125, 126.

To be contrasted with *R. excelsa:* a closer grower and apparently not reaching as great height; canes much more slender, say 1-2 cm. thick; fibrous sheaths tight closely woven and cloth-like and lacking a ravelled look, the fibers fine: leaves smaller and on petioles usually much shorter than the blade, dull dark green, segments 7-10 and cut to within 2-3 cm. of petiole, to 20 cm. long and 2 cm. or less broad, main ribs 2 or 3 and intermediate ones much fainter, cross-nerving not conspicuous, margins less strongly serrulate, apex long-narrowed and nearly or quite pointed, teeth less evident, hastula less prominently bearded and often only on one margin: spadix nearly or quite equalling the petiole, the rachillæ rusty-tomentose; staminate flowers clavate, to 6-7 mm. long, the corolla four to five times as long as the acutely and irregularly toothed calyx: fruit not described.



125. CONTRASTS IN HASTULAS. *R. excelsa* above; *R. humilis* beneath (×1).

"Probably of Chinese origin, but it has been introduced into Europe from Japan," according to Beccari. Blume, in founding the species, states that it grew in the botanic garden or hortus in Leiden, Holland, under the name *Chamærops Sirotsik*, Sieb., from Japan. The name *Sirotsik* was later entered by Wendland in lists without diagnosis. I do not find that Siebold ever published *Chamærops Sirotsik*. Beccari cites *Chamærops excelsa* var. *humilior*, Thunb. Flora Ja-

ponica, 130 (1784); Thunberg does not name a variety but introduces a category marked by a Greek Beta and with the phrase "Prioris est species sed longe humilior." Whether he meant this species, *R. humilis*, or only a dwarf clon of *R. excelsa* cannot be determined unless there is an extant specimen.

Blume's specimen of *Rhapis humilis* is in the Rijksherbarium, Leiden, and photograph of it is before me by the courtesy of Dr. H. J. Lam. The picture shows that we have correctly interpreted the species.

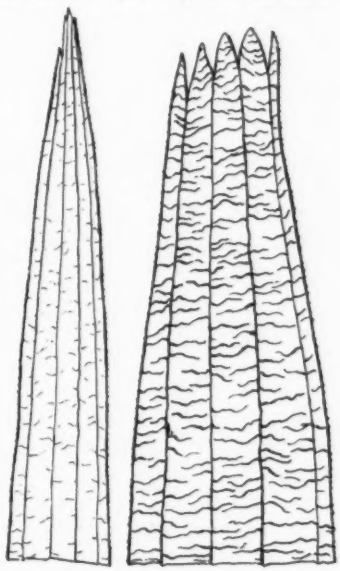
Commonly the two species, *R. excelsa* and *R. humilis*, are distinguished as tall and dwarf palms respectively, but these designations cannot hold in practice. We have noted that clons of *R. excelsa* may remain very dwarf indefinitely (Fig. 120), and I have seen *R. humilis* 12 feet tall and yet with no sign of blooming.

The slender lady palm is less common in cultivation than the large lady palm. It is a neater more condensed plant for growing in tubs and for house use, and the foliage is less coarse although the other excels in its brighter color.

Rhapis filiformis, Burret, in Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, xiii, 586 (1937). Segments 3, united at base, linear-lanceolate to linear, to 3 cm. broad, main ribs 4, attenuate to apex: spadix yellowish-furfuraceous and with many filiform rachillæ: fruit unknown. Province Kwangsi, China.

Rhapis gracilis, Burret, in Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, x, 883 (1930). Stem about 1 cm. diameter: sheath slenderly and gracefully fibrous: leaf-segments 3 or 4, to nearly 3 cm. broad, the main ribs 3 or 4, apex acutely toothed: spadix about 20 cm. long, simple or lower parts again branched: fruit globose, 8-9 mm. diameter. Province Kwantung, China.

Rhapis laosensis, Becc. in Webbia, iii, 220 (1910). Slender, stems 15 mm. or less diameter through leaf-sheaths which are composed of soft capillary fibers: leaf-segments usually 3, to 25 cm. long and 6 cm. broad, with 5-7 ribs, but sometimes as many as 9 and with fewer ribs, closely toothed as if acuminate at apex, shortly united at base but at times practically free, shiny above and paler underneath, petiole very slender and to 35 cm. long:



126. LEAF-TIP of *Rhapis humilis* at left, and of *R. excelsa*. Natural size.

spadices shorter than petioles, with sinuous rachillæ: fruit undescribed. Southern Laos, Indo-China.

Rhapis micrantha, Becc. in Webbia, iii, 220 (1910). Habit of *R. excelsa* but the 6-10 leaf-segments free (not joined) to the base, to 25 cm. long and 4 cm. broad, with 5 or fewer ribs, apex nearly acute, outer layers of sheath fibers flattened and brown and not ruffled: fruit larger than that of *R. excelsa*, 8-9 mm. diameter: flowers small. Western Tonkin, Indo-China.

Rhapis multifida, Burret, in Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, xiii, 588 (1937). Stem with leaves about 2 m. tall, about 1 cm. diameter: sheaths with exterior fibers brown and regularly disposed and inner fibers stouter: leaf-segments 12, main ribs 2, narrowly linear-lanceolate, about 1.5 cm. broad, attenuate to apex, joined at base: spadix about 28 cm. long beyond the spathe-valve which is long and tubular, much branched, rachillæ furfuraceous: fruit subglobose to oval, 9 mm. long. Province Kwangsi, China.

Rhapis robusta, Burret, in Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, xiii, 587 (1937). Stem with leaves 2 m. or more tall and about 1 cm. diameter: sheaths brown, with regularly disposed slender fibers: leaf-segments 4, cut nearly to base, the main ribs 3 or 4, lanceolate to broad-lanceolate, to about 5 cm. long and 2.5 cm. broad: spadix about 25 cm. long, 3-forked, the rachillæ slender and brownish-furfuraceous: mature fruit not described. Province Kwangsi, China.

Rhapis subtilis, Becc. in Webbia, iii, 227 (1910). Small and slender palm, 1 m. or less tall: sheaths of capillary soft fibers like those of *R. laosensis:* leaf very small, divided to top of petiole into 2-4 broadly linear segments to 10 cm. long and to about 2 cm. broad, the apex nearly rounded: fruit not described. Lower Laos, Indo-China.

127. FRUITS of *Rhapis excelsa* (×2½).

Rhapis cochinchinensis, Martius, is unidentified, but probably a Licuala. *R. Kwanwortsik,* Wendl., is perhaps a form or race of *R. excelsa.* The name has not appeared in lists in recent time. *R. javanica,* Blume, attributed to Java is apparently a form of *R. humilis* or *excelsa;* probably described from material in cultivation.

ARTICLE 12. PTYCHOSPERMATE PALMS.—SUPPLEMENT.

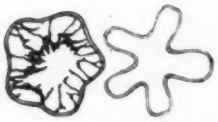
Four years ago I made review of the Ptychospermate palms grown in the western hemisphere so far as I then was able to make them out. The genera on which I published in July 1935 (Gent. Herb. iii, fasc. viii) are these: Actinophlœus, Adonidia, Archontophœnix, Balaka, Hydriastele, Normanbya, Ptychosperma, Rhopalostylis. I now bring the subject down to date, for the benefit of planters. Only Ptychosperma and Actinophlœus are really involved, although a few other notes may be added.

Adonidia was known to me then in the western hemisphere only from Cuba and the Canal Zone. Now I have seen it in southern Florida, and David Fairchild has recently published on it (Occasional Paper No. 1, Fairchild Tropical Garden, Coconut Grove, September 1938). He praises this Philippine palm highly and deservedly as destined "to take a prominent place in our dooryard gardens where it will fill them with a charm that too many of them still need." The clusters of bright red shapely fruits and the attractive appearance of the tree make this palm an uncommonly desirable acquisition.

Balaka is listed as in cultivation in the United States but I have not seen a plant of it, "such plants as pass under that name" (as I stated in my paper) "having been *Ptychosperma elegans*."

Normanbya was not known by me to be in the United States when I wrote the paper in 1935. Seeds have now been introduced and it may soon be in evidence in Florida. Notes on this tropical rainforest Australian palm are sent me by Will R. Holloway, Gordonvale, North Queensland, at the base of the Cape York peninsula, and a few extracts from his letter may be transcribed. He was able to obtain *Normanbya Normanbyi* in the wild on the Daintree River in northern Queensland.

"I have never seen it mentioned in any description of this palm, but the underside of the pinnæ have the whitish ash colour the same as in Archontophœnix Alexandræ. The colour of the fruit was the same as that of a beautifully coloured peach, while the pulp on being removed had a very fruity odour but I did not experiment. The trunk is always solitary. The timber of the trunk is sometimes used for making ornamental walking sticks, being as black as ebony but with small red flecks in it which makes it very distinctive.



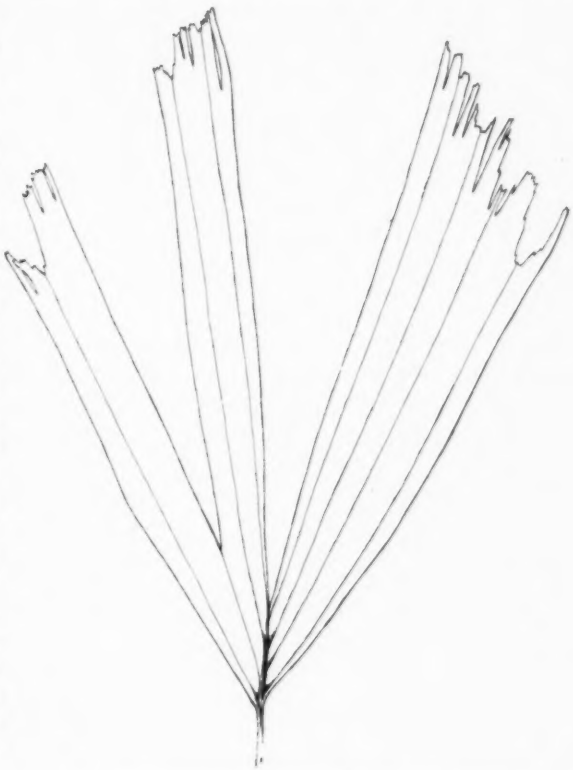
128. CROSS-SECTION OF seeds of *Ptychosperma elegans* left, and of Actinophlœus (×2).

129. SPATHE of *Actinophlœus Nicolai* (×½).

130. SPATHE of *Ptychosperma elegans* About three-eights natural size.

"The distribution of this palm appears to be very limited, probably growing only in a narrow belt of rainforest in the Daintree valley, north of Cairns."

Ptychosperma and Actinophlœus are separated primarily on the nature of the albumen (contents) in the ripe seed,—much ruminated by intrusion of seed-walls in Ptychosperma, and plain in the other genus (Fig. 128). Burret now finds there is inconstancy in the albumen in some of the Ptychospermas and mentions *P. Hallrungii* in particular, and I have noted marked differences in *P. elegans* itself; he unites the two genera, with consequent changes of nomenclature. From such observation as I have been able to make on species of the two groups I am impressed by other kinds of differences aside from albumen, such as habit, foliage characteristics and spathes (Figs. 129, 130); perhaps floral and other differences of importance might appear with further study. The two are unlike horticulturally, and I am inclined to retain them as separate genera until more conclusive investigations have been made. My main purpose in the present writing, however, is not to pronounce on this point but to record two species other than *Macarthuri* now in cultivation in Florida and Cuba. Palm growers can aid identification by sending good specimens.



131. End of leaf of *Actinophlœus Nicolai* (×⅓).

ACTINOPHLŒUS, Becc. The Cluster Palms.

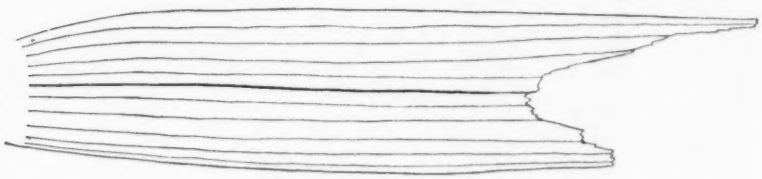
Soboliferous (trunks 2 or more) rather small palms: leaves rather thin and flexible, the lateral pinnæ tending to end in fishtail form: spathe narrow, small, the valves or parts long-pointed: seed with plain albumen. Species a dozen or so, in New Guinea, a few of which are in cultivation.

Actinophlœus hospitus, Burret, in Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, xi, 206 (1931).

Ptychosperma hospitum, Burret, l. c. xii, 596 (1935).

Stems or trunks in a clump (soboliferous), to 6 or 7 m. tall: leaves 2-2.5 m. long, of which the petiole may be .2 dm.; lateral leaflets regularly and separately placed on the upper leaves but more or less grouped in 2's or 3's in the lower ones: differs from *A. Macarthuri* (of which it may be a var.) by its usually less shining foliage (although described, "segmenta omnia utrinque nitentia"), much narrower side leaflets as a rule, mostly under 4 cm. broad and often only 2 cm. and the sides more nearly parallel, with very little if any of the transverse mottling that is likely to appear on leaves of that species.

Described from a tree numbered V. H. 17 in the Botanic Garden, Buitenzorg, Java, from which tree I also have specimens. Through the courtesy of Dr. Burret I also have photographs of his type specimens in Berlin and bits of the foliage. These materials represent a palm with narrow pinnæ which I can match from trees growing in southern Florida and Cuba, but other trees are difficult to place between the two species. Terminal leaflets of the two species are narrow with more or less truncate ends, as shown in Fig. 242 of *A. Macarthuri* in Gentes Herbarum, iii (fasc. viii, 1935). I have good specimens from seventeen trees of *Macarthuri* in the Buitenzorg gardens, six of which are cited by Radermacher as the basis for his extensive study of the species; some of these Java trees are undoubtedly *A. hospitus* however, if *A. Macarthuri* is interpreted as the one with very broad pinnæ often widest at about two-thirds the way toward the apex, taking the first picture, 1879, as the basis: Fig. 241, Gent. Herb. iii, fasc. viii.



132. End of lower pinna of *Actinophlœus Nicolai* (×⅓).

Specimens I have from Singapore as *Actinophlœus angustifolius* are *A. hospitus*.

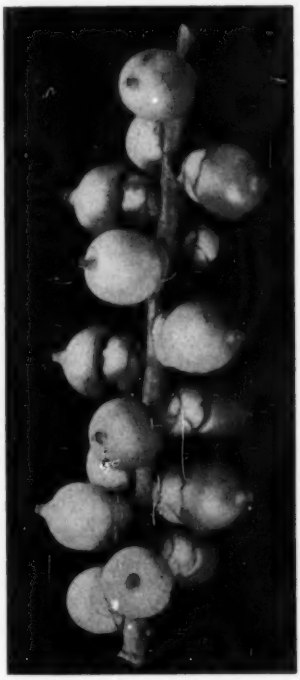
Before *A. hospitus* is fully understood we must know more about *A. cuneatus* and *A. propinquus*, which are not yet recognized as horticultural palms.

Actinophlœus Nicolai, Burret, in Fedde, Repert. xxiv, 263 (1928); Bailey, Gent. Herb. iii, 425 (1935), excl. *Kentia præmorsa*. Figs. 129, 131, 132, 133.

Romanovia Nicolai, Hort. (Sander), in Journ. Soc. Nat. Hort. de France, ser. iii, xxi, 665 (1899); append. i, Kew Bull., 1900, 50; Gard. Chron. ser. iii, xxxiii, 245 (1903).

Ptychosperma Nicolai, Burret, l. c. 263; Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, xii, 598 (1935).

Small soboliferous tree, the trunks several: foliage shining, pinnæ scattered rather than grouped on the rachis but not uniformly placed, the young leaves purple-red; pinnæ 25-40 cm. long, sometimes 6 cm. broad but most of them on a leaf narrower than that, midrib much the most prominent of the ribs, terminal leaflets approaching truncate but jagged and central ones with a long finger at upper side of apex: spathe purple: fruit red, broadly acorn-shaped

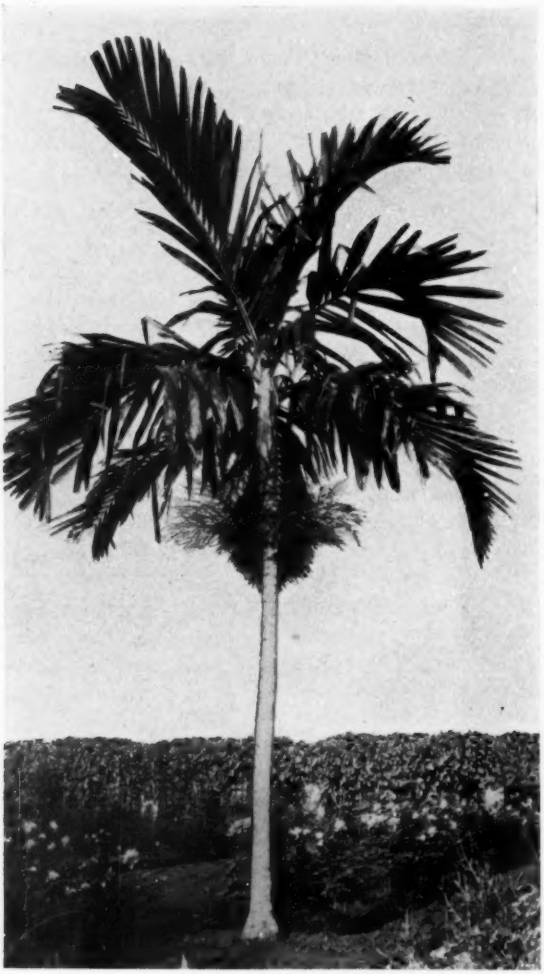


133. RIPE FRUITS, natural size, of *Actinophlœus Nicolai*.

134. COMMON CLUSTER PALM. *Actinophlœus Macarthuri*.

when fresh (Fig. 133), about 15 mm. long including bracts and 10 mm. thick, abruptly short-beaked.

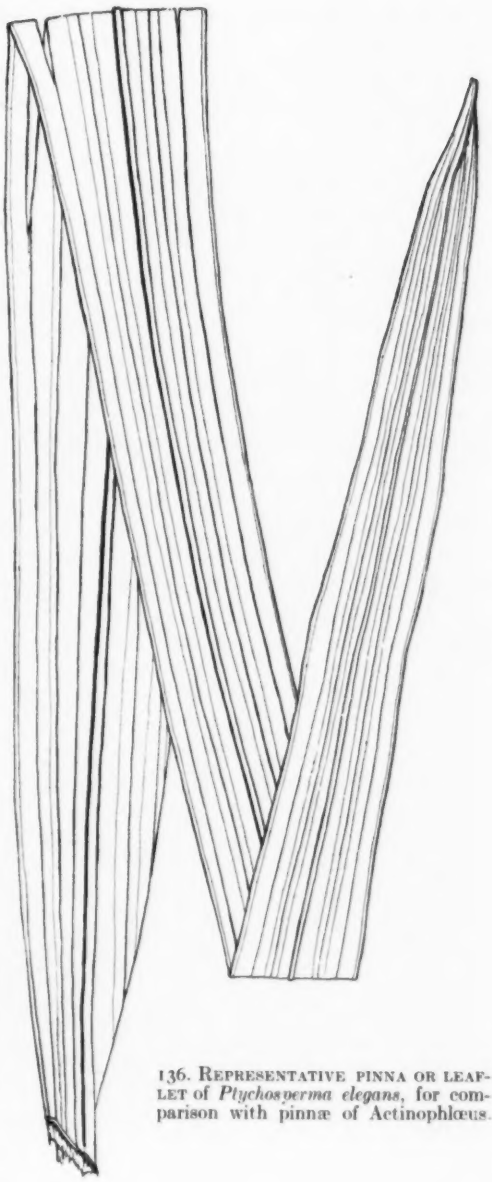
It has been mentioned a few times in horticultural literature abroad as a showy pot-plant, because of its tinted foliage, being bright red-purplish underneath and browner or duller on upper surface. It appears never to have been botanically described although variously named, and therefore it is difficult to make identification of mature or bearing trees. I know of two living plants that I take to be this species, one in the University Botanical Garden in Carlos III, Havana, Cuba, and the other not far away at the Experiment Station in Santiago de las Vegas; probably it is planted elsewhere in the Occident. The fruits in Fig. 133 are from the handsome Havana tree, which in size and habit is much like *A. Macarthuri*.



135. FRUITING TREE of *Ptychosperma elegans*. Southern Florida.

Actinophlœus Macarthuri, Becc., Fig. 134, is fully enough described in the paper to which this article

is a supplement so that repetition is not needed. I have specimens of it from many parts of the world, for it is now a widely distributed cluster palm. The broad lateral pinnæ are often widest above the middle, being somewhat narrowed toward the summit, and they are sometimes nearly or quite a yard in length. The color is a grayish-green, surface very shiny, and in the herbarium the leaves have an almost pruinose look.



136. Representative pinna or leaflet of *Ptychosperma elegans*, for comparison with pinnæ of Actinophlœus.

PTYCHOSPERMA, Labill. The Solitaire Palms.

Trunk single as far as I know: leaves not in fishtail form at end although irregular and erose or jagged: spathe large and broad, the valves ending rather abruptly in a point as far as I have seen: seed prevailingly with ruminate albumen but variable in this respect even in the common *P. elegans*. About 16 species, Australia, New Guinea and eastern Pacific islands.

Ptychosperma elegans, Blume, is the only one I know in cultivation in

the western hemisphere, and it is sufficiently described and well illustrated in my former paper. Fig. 136 is a pinna, for contrast with those of Actinophlœus as seen in Figs. 131, 132. Note also Fig. 135, that shows a good tree of *P. elegans* in flower and fruit in southern Florida; for comparison with Fig. 134.

My paper explained that Robert Brown described this species in 1810 as *Seaforthia elegans* (a name afterwards erroneously transferred to *Archontophoenix Cunninghamiana* and still so employed by planters), but the genus Ptychosperma had been founded a year earlier for the same plant; Seaforthia therefore falls. Yet it will be interesting in the establishing of identities to examine Brown's specimens.

The type specimens of *Seaforthia elegans* are now at the Natural History Museum of the British Museum and they confirm our present understanding of the species. Both spadices and leaf are accompanied by labels bearing the heading "R. Brown, Iter Australiense, 1802-5," and in both cases the number is 5794. Staminate flowers I have seen from these old specimens are like those of the plants we now know as *Ptychosperma elegans*, and also like those native in Queensland.

The solitaire palm, *Ptychosperma elegans*, is variable both in the wild and in cultivation. This variation is observable in fruit as well as in foliage, one of the round-fruited forms having been designated var. *sphærocarpum*, Becc. Probably several binomials in Ptychosperma can be combined under *P. elegans*. This subject has been investigated by C. T. White, Government Botanist of Queensland, whose unpublished conclusions were followed by me in my paper of 1935 (as stated in Gent. Herb. iii, 415). This paper has now been published in the Proceedings of the Royal Society of Queensland, xlvi, 80-82. White concludes that *Ptychosperma Capitis Yorkii*, Wendl. & Drude, *P. Jardinei*, F. M. Bailey, and *P. Wendlandiana*, Burret, "represent one and the same palm," and the name *Capitis Yorkii* has priority. He writes in his paper, "*P. Capitis Yorkii* is probably only at most a variety of the more widely distributed *P. elegans;* the only tangible difference I can see is that the leaf segments of *P. Capitis Yorkii* are narrower than those of *P. elegans*, the width of the former being 2-4 cm., those of the latter 5-8 cm." This agrees with my own estimate derived from native material of *P. Capitis Yorkii* and part of the type specimens of *Archontophœnix* (*Ptychosperma*) *Jardinei*. I have kept *P. Capitis Yorkii* separate only for historic reasons, and think it should be included in the definition and synonomy of *P. elegans*.

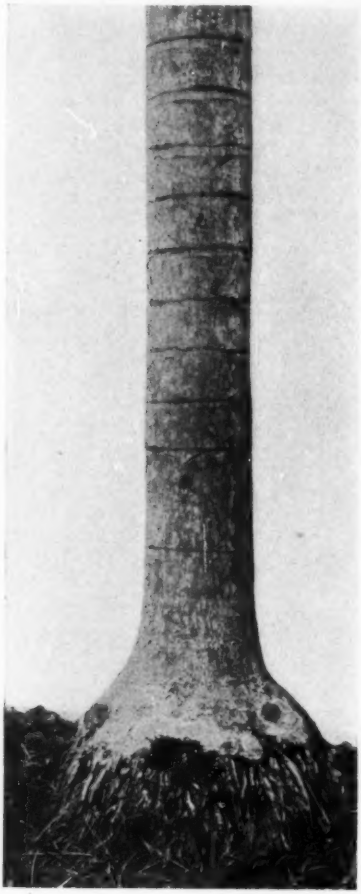
This case interests planters because the name *Wendlandiana* is still frequent in lists. White states that the palm has always been known in tropical gardens as *Hydriastele Wendlandiana*, "being probably distributed

from Buitenzorg under that name." All palms I have seen growing as *Hydriastele Wendlandiana* are *Ptychosperma elegans*. Specimens in my collection from juvenile American glasshouse plants passing as *Kentia Wendlandii* are apparently *Actinophlæus Macarthuri*.

137. LUCUBA PALM in bloom. Puerto Rico. See page 218.

ARTICLE 13. LUCUBA PALM IN THE NEW WORLD.

Six years ago I was attracted by a pinnate-leaved small palm with conspicuously ringed trunk standing near the main building at the Federal Experiment Station, Mayaguez, Puerto Rico. It had the look of the palm that passes as *Dypsis* or *Areca madagascariensis* (*Chrysalidocarpus madagascariensis*), but was clearly not that species, having only a single trunk and other important differences. The tree was conspicuous in its large infrafoliar spadix with attractive hanging rachillæ, although all the staminate flowers had fallen and the fruit was unformed. Later I received a photograph of what is apparently the same palm, taken at Pará at the mouth of the Amazon sent by B. E. Dahlgren of the Field Natural History Museum in Chicago. If it is growing in two such widely separated places it must be standing elsewhere in the western hemisphere and it is worth while to undertake identification. To this end, flowers and fruits and other parts have been gathered for me by Claud L. Horn of the Puerto Rico Experiment Station at Mayaguez.

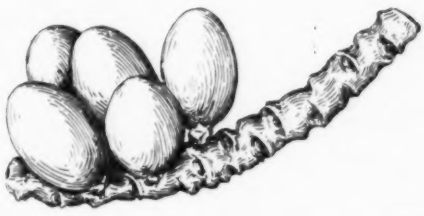


138. TRUNK of *Chrysalidocarpus lucubensis*.

The palm is *Chrysalidocarpus lucubensis*, Becc. from the forest of Lucuba at an altitude of 500-800 meters on the island Nossi-Be off the northwestern coast of Madagascar, about 13 degrees south latitude: Beccari in Engler, Bot. Jahrb. xxxviii, Beibl. hft. 3, p. 35 (1906); and Palme del Madagascar 44 (1912) as nearly as one may determine from diagnoses. Figs. 137, 138, 139.

Spineless: monœcious, the sexes on different spadices: trunk single, erect and straight, strongly ringed, enlarged at the ground but otherwise uniform, to 6 or 10 m. or more tall: leaves pinnate, narrow and long, upper ones curved at top, lower ones more or less drooping, glabrous, glossy on upper surface; pinnæ numerous, in groups or clusters along the sharp margin of the rachis, 50-60 cm. long and about 3 cm. broad at middle, those near center of large leaf nearly or quite 1 m. long, all long-acuminate into a slender briefly furcate end and much narrowed to base, one rather strong rib either side the midrib and the other veins obscure: spadices arising from axils of the large and broad leaf-bases just underneath the crown, perhaps half as long as the leaf-blade, composed of a long central axis and many branched and drooping side branches; rachillæ (ultimate branchlets) 25-50 cm. long, rather slender, glabrous, flowers in shallow cavities but not immersed; staminate flowers about $3\frac{1}{2}$ mm. long, obtuse in bud, sepals imbricated, stamens 6; pistillate flowers short and nearly globose, about 3 mm. diameter, attached on side near bottom, stigmas 3 and projecting in anthesis: fruit oblong, about 15 mm. long when fresh and then not evidently thinner at base and rounded at apex, about 13 mm. long when dried and then somewhat narrowed to bottom and one side perhaps slightly flattened so that the object may have an obovate look and a low ridge down one side; seed 10-11 mm. long and 7-8 mm. broad, obscurely ornamented with looped veins, albumen plain and clear white and hard, embryo small and about midway on one side.

Fruits from Puerto Rico do not show one side flattened as markedly as in Beccari's picture Fig. 35 in Palme del Madagascar, and there are other slight discrepancies that probably are not significant. The present account calls attention to this attractive palm in the western hemisphere, and it is hoped that more critical studies may now be made of it. These studies will involve not only final identification but also the nomenclature of this group of palms, in which there is likely to be decided change.



139. Fresh fruit of *Chrysalidocarpus lucubensis* ($\times 1\frac{1}{4}$)

ARTICLE 14. COCCOTHRINAX OF FLORIDA.

We are now to discuss the silver palm of Florida, both in respect to its distribution and its nomenclature. We shall find that even yet the botanical name of this palm has not been settled.

In 1899 Charles Sprague Sargent undertook, in Botanical Gazette, to clarify the silver palms of Florida. He founded the genus Coccothrinax to include members of the old genus Thrinax with ruminate rather than plain seeds; and the Coccothrinaces bear relatively much shorter spadices than the Thrinaces, and there are other differences. The genus Coccothrinax is now accepted by all botanists. Sargent did not undertake to discuss species of Coccothrinax in the West Indies, although he referred *Thrinax argentea*, Roemer & Schultes, to Coccothrinax as *C. argentea*. The Florida palm he described as a new species, *Coccothrinax jucunda;* in his Silva, 1902, he says the name *jucunda* (Latin, *pleasant, agreeable*) was chosen "in allusion to the sweet edible flesh of the fruit."

The Florida silver palm had been named some twenty years earlier (1878) than Sargent's work,—by A. W. Chapman as *Thrinax Garberi*, the dwarf form about Miami. In 1897 he called the usual tall silver palm south of Miami and on the keys *Thrinax argentea*, thus bringing the West Indian name *argentea* into the Florida flora. This *Thrinax argentea* of Chapman is the *Coccothrinax jucunda* of Sargent; and on the supposition that the *Thrinax argentea* of the farther West Indies is the same as the Florida plant, the latter would take the name *Coccothrinax argentea*, which has been the custom from those days until very recently. It will be noted that although Sargent made the binomial *Coccothrinax argentea* he only brought over the indefinite name of a West Indian palm and retained *C. jucunda* for the plant of Florida.

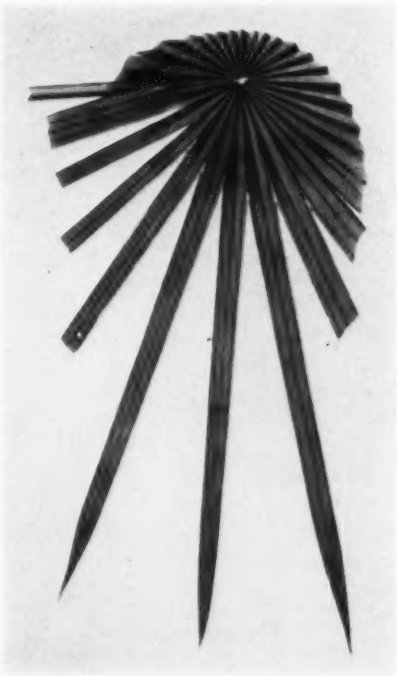
Sargent recognized the name *Thrinax Garberi* of Chapman in his original account in 1899 and made the binomial *Coccothrinax Garberi*, thinking it "probably only a depauperate form," a conclusion now well accepted. If *C. Garberi* is the same species as *C. jucunda*, then *Garberi* must hold in nomenclature, being the older, and this disposition has recently been adopted. If the West Indian *C. argentea* is the same species as the Floridian, then that name becomes standard (as I have said) and holds in preference to both *Garberi* and *jucunda*. We have, therefore, a question both of identification and of nomenclature.

We are not to discuss the Antillean palm in this paper other than to determine whether it is the same species as the Floridian. The one in the

Bahamas, as I have seen it on New Providence and Andros islands, is the same as the one in Florida, but I have not seen this palm on any other of the West Indies, either in the Greater or the Lesser Antilles, nor does it appear in herbarium specimens from those regions; nor does the original description of *Thrinax argentea* by Roemer & Schultes, 1830, designate the Florida palm. The name *Thrinax argentea* had appeared in 1829 in the third edition of Desfontaine's catalogue of plants in the Royal Gardens, Paris, but wholly without description and therefore does not affect the history. Roemer and Schultes did not know the habitat of their palm, but when Martius took up the name in his Historia Naturalis Palmarum in 1838, he attributed it particularly to Jamaica, Haiti and Santo Domingo. Martius' diagnosis does not apply particularly to the Bahama palm.

We may find difficulty, in the final analysis, in typifying an Antillean plant that Sargent called *Coccothrinax argentea* and in deciding whether the old accounts designated a true Thrinax or a Coccothrinax. Even the picture of the fruit in Martius (tab. 103) leaves us in doubt: the external marks seem to indicate Coccothrinax, but the longitudinal section suggests Thrinax. The fancy picture of the sterile tree in tab. 163 does not help, but the short spadix mentioned in the text indicates Coccothrinax; this picture cannot mean the Bahaman and Floridian palm as the "hang" of the leaves is quite unlike that species.

The Bahaman-Floridian species is distinguished against the skyline by one who really knows this group of palms, for its form is distinctive. The narrow gradually tapering leaf-segments show well even on the herbarium sheet with the peculiar glabrous glossiness of the upper surface; but the particular mark is the pearly silveriness of the under surface produced by a close and fine pubescence, as well as the sup-



140. JACQUIN'S PICTURE of *Palma argentata*, 1803. Reduced.

pressed pubescence on the ridge-folds of the upper surface of the young leaf.

In 1830 Schultes & Schultes in the Roemer & Schultes edition of Linnæus' Systema Vegetabilium (vol. vii, pt. ii, page 1300) gave description of *Thrinax argentea*, Loddiges, as I have indicated in a previous paragraph. The authors did not know the nativity of the palm. They recorded a specimen in the Munich gardens sent by Loddiges; the plant was young when they described it and they made no mention of flowers or fruits (except they quoted Martius to the effect that the embryo was subvertical). There is nothing in the account to determine the genus, as genera of this relationship are now understood.

141. SILVER PALM on Big Pine Key, southern Florida. *Coccothrinax argentata.*

Martius took up the Schultes palm, also as *Thrinax argentea*. I am informed by the Museum and Botanic Garden at Munich, where Martius worked, that the herbarium specimens of *Thrinax argentea* were loaned long ago and were not returned. On botanical grounds I must therefore eliminate the name *Coccothrinax argentea* from the Florida flora.

Search for a name for the Florida-Bahama palm is now transferred to a publication about one hundred years earlier than that of Sargent. In 1803 Jacquin published *Palma argentata* in Fragmenta Botanica, Vienna, with a good Latin account and picture of part of a leaf. This palm came

from the Bahamas and was grown under glass in the gardens at Schoenbrunn, near Vienna. Fig. 140 is a reduction from the Jacquin picture; it is the palm we have known in Florida as *Coccothrinax Garberi* and *C. jucunda* and erroneously as *C. argentea*. Even the scarious marks on the ridge-folds beyond the petiole are indicated in the original but do not appear in the reduction in Fig. 140. The Latin text mentions the silvery pubescence on the under surface and the glabrous green of the upper surface.

The genus Palma appears as early as 1768 in Philip Miller's Gardener's Dictionary, 8th ed., with diagnosis and binomial combinations; in fact, the name appears in his Abridged Edition, 1754, but that work had not adopted the Linnæan method.

Putting all these findings together we have the following result:

† **Coccothrinax argentata,** trans. nov.* Figs. 140, 141, 142, 143.
Palma argentata, Jacq. Fragm. Bot. 38 t. 43 fig. 1 (1803).
Thrinax Garberi, Chapman, in Bot. Gaz. iii, 12 (1878); Fl. So. U. S. ed. 2, 651.
Thrinax argentea sensu Chapman, Fl. So. U. S. ed. 2, 651 (1883) non Roem. & Schult.
Thrinax argentea var. *Garberi*, Chapman, Fl. So. U. S. ed. 3, 463 (1897).
Coccothrinax Garberi, Sarg. in Bot. Gaz. xxvii, 90 (1899).
Coccothrinax jucunda, Sarg. in Bot. Gaz. xxvii, 89 (1899).
Coccothrinax argentea, Auth., non Sarg.

Only one author, as far as I know, has taken up the *argentata* of Jacquin. This was Martius, who made it a synonym of the later *argentea*. Index Kewensis enters it as *Palma argentea*, as also the Index of American Palms, page 272. In original publication the names *argentata* and *argentea* are independent of each other. What is to become of the West Indian *C. argentea* I shall discuss in another paper, but there is no inharmony between the two names and one name cannot invalidate the other.

It now remains to discuss the range of *Coccothrinax argentata*. We have noted that the original or type locality for *Coccothrinax Garberi* was about Miami, Florida. In founding the species *C. jucunda*, Sargent did not specify a type locality, saying only that it is "now known only in Florida, where it inhabits dry coral ridges and sandy flats from the shores of Biscayne Bay, along many of the southern keys, to the Marquesas group west of Key West." I have seen his botanical specimens in the herbarium of the Arnold Arboretum.

Southernmost limit in the United States is on the uninhabited Mar-

* *Translatio nova*, new transfer or new combination: Gent. Herb. i, page 8.

quesas keys southwest of Key West. The palm from those islands has been described as a botanical variety by Beccari (Webbia, ii, 313, 1907): *C. jucunda* var. *marquesensis*. I have visited that group of islands and have good specimens of its palms, but have not found the Coccothrinax there to show varietal differences. A clump of these Marquesan trees is seen in the background of Fig. 75 in the Thrinax paper (Gent. Herb. iv, fasc. iv, 1938).

Northernmost limit of *C. argentata* as a native plant is not definitely established. John K. Small, who knew its region well, states (Journ. N. Y. Bot. Gard. xxxi, 63) that "occasional specimens may be found on the coastal sand-dunes along the Gulf Stream up to the Lake Worth region," which is in Palm Beach County. In an earlier paper (vol. xxv, 242) he stated that the occurrence of the silver palm along construction work north of Miami was because "migratory birds brought the seeds northward either from further south in Florida or from the West Indies." This statement is based on the assumption that the West Indian palms are the same as the Floridian, but no other species than *C. argentata* has been reported from such supposed introductions.

142. SMALL FORM, WITH SUCKER, of *Coccothrinax argentata*, from the Miami region.

What appears to be a native colony of *C. argentata* is reported to me by Clyde Harris, who lives near Palm Beach and who sends good photographs and specimens. He finds it near the sea from Oak-

land Park north to Deerfield in Broward County, the northernmost stand being nearly up to the line of Palm Beach County. Proceeding southward from Palm Beach along the beach road, he writes: "I have not found Coccothrinax again until east of Deerfield and approaching Hillsboro Lighthouse. In this strip of coast the palm is fairly abundant and occasional plants stand above the others with several feet of stem. Still farther south, near the coast opposite Pompano, land has been cleared for homesites, and the silver palm is conspicuous as people have permitted specimens to remain as a choice part of the native vegetation. The next several miles between Pompano and Oakland Park, but east of the inland waterway, Coccothrinax palms are present in even greater abundance. There is a low scrub of them near the shore road, and westward about a quarter of a mile on the east slope of a ridge scattered specimens are found with two or more feet of stem. (I have found several with a little more than five feet). These palms of the ridge are part of an environment where there is considerable competition for light. Such species as *Zanthoxylum Fagara*, *Z. Clava-Herculis*, *Genipa clusiifolia*, and *Icacorea paniculata* are associates. (Also, *Zamia floridana* is present, but shows need of more light.)"

We may state the natural range of *Coccothrinax argentata* to be along the eastern coastal region and keys of Florida from Palm Beach County to the Marquesas islands beyond Key West, and in the Bahamas.

If photographs of native silver palms are examined, one is likely to note young plants about the base, as if they were seedlings (Fig. 142). These are really offshoots or suckers, however, soon detaching from the parent; they have been described and figured recently by John T. Presley in Journal of Heredity (xxv, 485, 1934).

I remember to have seen very little of the *argentata* palm in cultivation. What is called *argentea* in plantations appears to be one or more of the West Indian species; but the brightness of the Florida native silver palm should make it a welcome addition to parks and home grounds. Now that we distinguish between the Floridian and the West Indian silver palms, we may pay more attention to the native one.

ARTICLE 15. GEONOMAS IN THE LESSER ANTILLES.

The Geonomas are forest palms of small or medium stature, frequenting moist habitats, often or usually producing more than a single trunk or cane (soboliferous); some of them are acaulescent. The latest enumeration and arrangement of them is by Burret, 1930, who recognizes 169 species: in Engler's Botanische Jahrbücher, lxiii, heft 2. The genus is exceeded in the western hemisphere only by Bactris, which totals about 180 species if Pyrenoglyphis is retained within it. The Geonomas range from Mexico far into South America, and have been particularly collected in Costa Rica, Colombia and Brazil.

In the West Indies Geonoma is represented by less than a half dozen kinds; it is customary to refer most of these Antillean plants to continental species, but apparently they are all endemic to their islands.

On the Greater Antilles Geonoma has been ascribed only to Cuba and Hispaniola. The one on Cuba is *Calyptronoma dulcis*, Bailey (Gent. Herb. iv, 168, 1938). The one on Hispaniola is *G. oxycarpa*, Martius, with which *G. mexicana* has been combined, although the two appear to be quite unlike; this question I hope to discuss in another paper. This leaves us free to consider the species of the Lesser Antilles.

The Geonomas on four of the Lesser islands may now be described; what remains on other islands of the chain is not yet known. The four islands are Guadeloupe, Dominica, Martinique, Trinidad. In Haiti and the French islands the Geonomas are known as "Coco-macaque." Before proceeding to diagnoses of these Geonomas, however, we may pause to understand the particular features of the genus as a whole.

GEONOMA is one of the tribe or subgenus Areceæ, comprising pinnate palms with usually unisexual flowers. In this genus the leaves are either completely pinnate or pinnately veined, with continuing rachis, divisions of the leaf irregular as to number, position and width, plant spineless throughout and often arundinaceous with very slender ringed canes or culms: spadices infrafoliar or interfoliar, either a straight single slender spike or (as in the West Indian species) a bifurcate or trifurcate cluster in either case accompanied by a papery spathe of 2 pairs of valves (4 divisions or units) but which may split at maturity into more numerous apparent parts; flowers very small, sunken in spirally disposed pits of the rachilla, the two sexes on the same axis in different positions, usually the pistillate intermediate between two staminates, more rarely the species said to be dicœcious; perianth-parts glume-like, 6, free or sometimes united at base, sepals imbricate in bud, petals valvate; stamens 6, filaments united at base or in a tube; staminodia in pistillate flowers represented by a corolla-

like entire or toothed tube; stigmas 3, prominent at anthesis, and ovary 3-celled: fruit a single small globose or ovoid seed-like body with thin soft exocarp but drying hard, commonly not exceeding 8-10 mm. in diameter when dry; seed 1, albumen plain and dense, embryo basal.

A. Leaflets or leaf-segments narrow, the broadest not much exceeding 4-6-8 cm. wide, narrowest ones at apex, gradually narrowing into very long bifurcate ends and perhaps some of them produced into whip-like extensions. Fig. 144.

143. FRUITS OF SILVER PALM, *Coccothrinax argentata*. About one-half natural size.

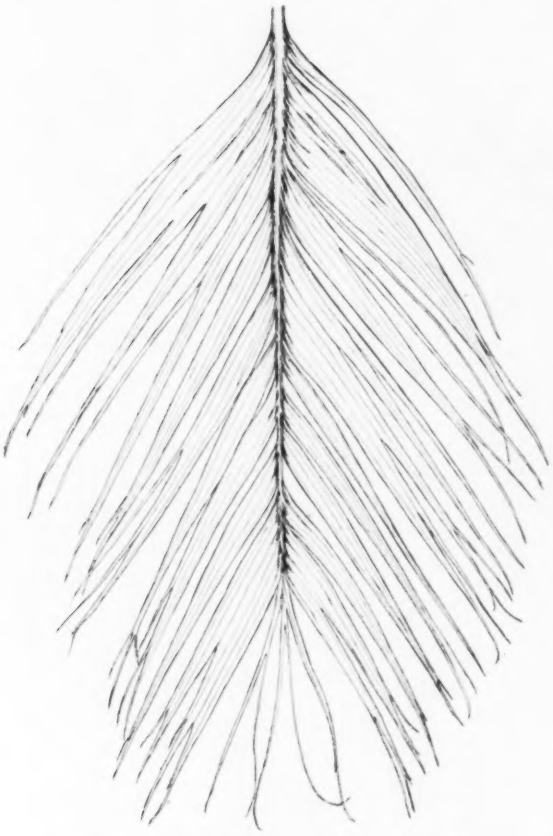
B. Rachillæ (ultimate flowering branchlets) thick, about 5 mm. broad at middle when dry: fruit ovoid, granular, about 8-9 mm. long when dry, grayish or dun. Guadeloupe ..... *G. Dussiana*

BB. Rachillæ slender, about one-half as broad or thick as in B: fruit 5-6 mm. long when dry, black, not granulate but perhaps faintly longitudinally lined. Dominica ..... *G. dominicana*

AA. Leaflets diverse in width but at least part of them 9-20 cm. wide, broadest ones at apex of leaf, conspicuously narrowed into a long caudate entire end that may be only 1 mm. thick at termination, the many main veins converged to the curved entire apex. Figs. 148, 151.

B. Rachillæ and rachis hardly visibly subpubescent: leaf-segments seldom exceeding 9-10 cm. in width. Martinique ..... *G. martinicensis*

BB. Rachillæ decidedly even if sparsely hairy-pubescent: segments, particularly terminal ones, to 20 cm. broad. Trinidad ..... *G. vaga*



144. Leaf-blade of *Geonoma Dussiana*. Guadeloupe. Much reduced.

145. Spathe, beginning to open, of *Geonoma Dussiana* (×½).

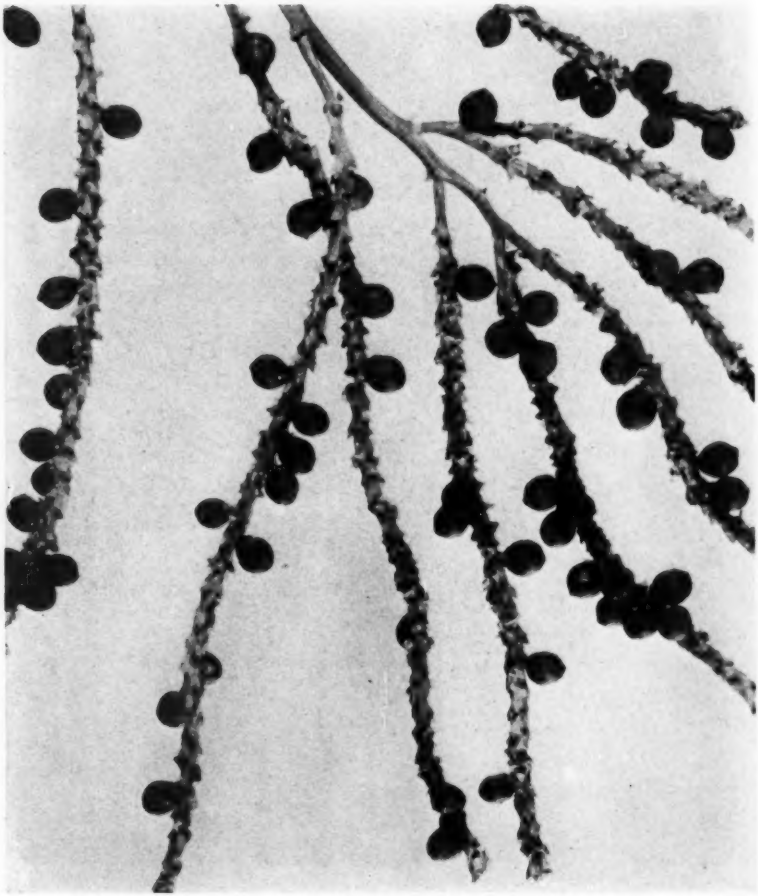
146. MATURE DRY FRUITS of *Geonoma Dussiana*. Guadeloupe. Nat. size.

Geonoma Dussiana, Becc. in Fedde, Repert. xvi, 436 (1920). COCO-MACAQUE. Figs. 144, 145, 146.

G. vaga, Duss, non Grisebach & Wendl., Flore Phaner. Antill. Franc. (in Ann. L'Inst. Colonial Marseille, iii), 491 (1897).

G. undata, Burret, non Klotzsch, in Engl. Bot. Jahrb. lxiii, 213 (1930) as to Guadeloupe plant.

Stout soboliferous palm but often only one trunk persisting to the end in dense forests, to 8 m. tall, with aerial roots at base, conspicuous rings 3-6



147. MATURE DRY FRUITS of *Geonoma dominicana.* Dominica. Nat. size.

cm. apart, large trees 7-10 cm. diameter near base: leaves lively green, 1 m. and more long, glabrous but more or less minutely scurfy underneath, whitish prominent various veins underneath 2-4 mm. apart and very strong ribs 8-15 mm. apart on upper surface; pinnæ or segments relatively narrow (few of them 9 cm. and then down to 1 or 2 cm. broad), contiguously attached along the rachis, to 1 m. long including the narrow extremities which are mostly bifurcate: spadix infrafoliar (axils bare from leaves having fallen before fruits mature), rachis flat on upper surface and soon shedding the scurf from the convex under surface, to 20 dm. long, much branched, peduncle and primary axis standing out nearly horizontally and branches pendent; rachillæ thick (5 mm. when dry) and 2-4 dm. or more long, very closely puberulent if at all; spathe 15-20 cm. long and 6 cm. broad just before expansion; alveoles extended lengthwise, 4-5 mm. long after fruits have fallen: fruits about 10 mm. long when dry and slightly flattened, granulate or flecked and obscurely finely striate, gray or indifferent in color, perianth-parts and bracts remaining attached; seed free and loose in dried exocarp, nearly globular, about 6 mm. diameter, raphe extending the length of it, albumen very hard.

Deep woods, island of Basse Terre, Guadeloupe, 600-950 m. My own experience with this palm has been above and below Bains-Jaunes under the soufriere on Basse Terre, where I have seen it in all stages of growth. The pictures accompanying this account were made from specimens taken in that region, at altitudes of about 3,000 feet.

Beccari cites Père Duss numbers 3313 and 4198 as the basis for the species.

Geonoma undata, Klotzsch, with which *G. Dussiana* has been associated, is a Colombian species, reported also in Venezuela. It is quite unlike the Guadeloupe plant in its widely spaced pinnæ and different more slender short rachillæ.

148. LEAF-BLADE of *Geonoma martinicensis*. Martinique. Much reduced.

† **Geonoma dominicana,** spec. nov. Fig. 147.
G. pinnatifrons var. *vaga,* Burret, l. c. 246.

Arbor multo minus validus quam *G. Dussiana,* ad 7 m., truncus ad 6 cm. diam.: folium circa 6 dm. longum, tenue; pinnæ contiguæ, 4-5 dm. longæ et 1-6 cm. latæ, brevioribus bifurcatisque apicibus: spadix parvus, rami 5-16 cm. longi, 2-3 mm. crassi: fructus parvus, 5-6 mm. longus, globularis, abrupte acuminatus, niger, vix granularis vel striatus; semen liberum, circa 3 mm. diam.

Palm to 7 m. tall, trunk 6 cm. diameter: pinnæ various in width, 1-6 cm., contiguous on the axis, short, 4-5 dm. long, gradually narrowed to end but not produced into ribbon-like extremities, veins and ribs much less prominent, less numerous and strong than in *G. Dussiana* and therefore not so markedly striate, and leaves thinner and smaller: spadix small and slender; rachillæ very slender, 2-3 mm. thick when dry, to 16 cm. long, the pubescence (if any) slight and appressed: fruit small, 5-6 mm. long, globular but with a short point, black, scarcely striate; seed rather tight in exocarp but free, about 3 mm. diameter, raphe extending whole length.

Dominica. Grisebach and Wendland established *Geonoma vaga* on collections by Imray from Dominica and others from Trinidad, but the diagnosis applies only to the palm on the latter island; the Dominican species is clearly distinct and apparently unnamed as a species. My diagnosis of *G. dominicana* is drawn from Walter H. Hodge number 307, Herb. Gray, also Herb. Bailey (type), from rainforest on the precipitous slopes of Morne Colla Anglais, Sylvania, altitude 610-732 m., 1938.

149. SPATHE of *Geonoma martinicensis* (×½), open and split.

Geonoma martinicensis, Martius, in Palmetum Orbignianum, 28 (1839-1847); Hist. Nat. Palm. iii, 316 (1850). AILE À RAVET. COCO-MACAQUE. Figs. 148, 149, 150.

To 6 m. tall, trunks to 6 or 8 cm. diameter, ringed like a bamboo, the rings 5-8 cm. apart, several trunks or canes from one root, with aerial roots at base: leaves 1 m. or more long, thin, with very slender petiole deeply concave above and sharp-edged, glabrous, finely punctate between the veins underneath; pinnæ very irregular or diverse in width, broadest at about 10 cm. across and the slimmest less than 10 mm., length to 40 or 50 cm., main ribs on either surface about 1 cm. asunder and many fine ones between, prominently tapering into a long entire curved needle-point end: spadix in the axils of broken or fallen leaves

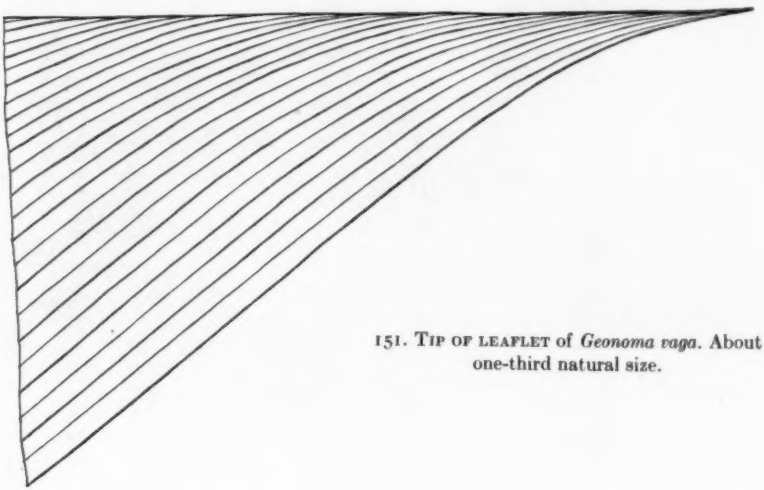
150. MATURE DRY FRUITS of *Geonoma martinicensis*. Martinique. Nat. size.

just underneath the crown, slender, about 50 cm. long, more or less twice branched, the papery spathes about 16 cm. long to point of attachment; rachillæ 20-30 cm. long, drooping, rather slender, 3-4 mm. thick when dry, axis wrinkled and at places very closely puberulent: fruit globose to nearly elliptic with short point, dull black, 5-7 mm. long including the stipe-like base that bears the persistent acute perianth-parts and bracts, becoming somewhat roughened and lengthwise striate; seed tightly filling the exocarp but essentially free, 4 mm. long.

Martinique. I have taken it in dense woods near Colson, about 1,800 feet altitude. I have examined material of *G. martinicensis* collected by Père Duss in 1882, named *G. vaga*.

Geonoma vaga, Grisebach & Wendl. in Fl. Brit. W. Ind. 517 (1864). ANARI. Figs. 151, 152.

Palm to 5 m. tall, perhaps higher; trunks cane-like, 2 cm. and more diameter, roughly ringed at 1-2 cm.: leaves 1-2 m. and more long, prominently many-ridged with outstanding ribs 1 cm. or less apart; pinnæ or segments exceedingly variable in width, from 1 cm. or even less to 20 cm., and 60 cm. long, glabrous, minutely punctate underneath between the many fine veins, apex conspicuously narrowed to a long curved needle-like end or tail: spadix infrafoliar from falling of leaves, 60 cm. long at full expansion, 2-3-branched, the peduncle and primary branches glabrous or soon becoming so; spathe to 30 cm. long, more or less furfuraceous; rachillæ 6-16 cm. long, slender, bearing loose hairs (particularly under or about the nodes), the surface more or less pimpled or wrinkled: fruit globular or a little longer than broad, about 7 mm. long when dry and mature, dull



151. TIP OF LEAFLET of *Geonoma vaga*. About one-third natural size.

152. MATURE DRY FRUITS of *Geonoma vaga*. Trinidad. Nat. size.

black, surface usually lightly pimpled, remaining perianth-parts on a very short not stipe-like base; seed free in the exocarp shell, globular, 4-5 mm. diameter, shining, raphe prominent.

Trinidad, Tobago, in forests and moist shady places. This species is perplexingly variable in leaf characters as evidenced by forty-four sheets of specimens now spread before me. Now and then a leaf bears only many narrow pinnæ an inch or two broad, yet the curved needle tips are still in evidence, and other characters remain. Thickness of the rachillæ is not constant, but the loose pilose character persists.

The latest monograph refers this Geonoma to *G. pinnatifrons*, Willd., of South America, but the two appear to be distinct species with different spathes and other characteristics. *G. pinnatifrons* is a small palm; it lacks the loosely hairy rachillæ, fruits are smaller (5 mm. long in *pinnatifrons*, 7 mm. long in *vaga*), and the alveole is conspicuously split or separated in front to its base when the fruit has fallen, which is not the case in the Trinidad species; this slit is preceded in fertile alveoles by a notch in the lower edge.